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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SHAH, SAMIR M	

ART UNIT	PAPER NUMBER
2856	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/586,105	CRICKMORE ET AL.	
	Examiner	Art Unit	
	SAMIR M. SHAH	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 July 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-12,14,15,17 and 20-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-12,14,15,17 and 20-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In view of the appeal brief filed on 07/23/2010, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

2. To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

3. A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Hezron Williams/
Supervisory Patent Examiner, Art Unit 2856

Claim Objections

4. Claim 17 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

As to claim 17, the limitation, “compression of the cylinder by the seismic mass increases stress in the optical fibre” does not further limit parent claim 15 because of the limitation, “axially displacing the seismic mass so as to compress the cylinder thereby increasing the stress induced in the optical fibre” of claim 15.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation "the base plate" in the 1st line. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Thomas (International Patent Application WO 03/081186 A2 hereinafter referred to as "Thomas").

(a) As to claim 21, Thomas discloses a fibre optic accelerometer (10) comprising a body (12) of compliant material having an internal cavity extending in an axial direction (figures 1-7; page 5, line 21 - page 6, line 18);

optical fibre (11) wound circumferentially around said body (12) (figures 1-7; page 5, line 21 - page 6, line 18); and

a seismic mass (23) located within said cavity, wherein the internal surface of said cavity is constrained against radial displacement (figures 1-7; page 5, line 21 - page 6, line 18).

Note as to claim 21, the degree of constraint is not claimed and the claim does not require constraining total radial displacement. Thomas' seismic mass prevents radial displacement of the internal surface of the cavity once the sides touch the mass thereby preventing further movement.

(b) As to claim 22, Thomas discloses the internal surface of the cavity being constrained by the seismic mass (23) (figures 1-7; page 5, line 21 - page 6, line 18).

Note as to claim 22, the degree of constraint is not claimed and the claim does not require the internal surface to be completely constrained by the seismic mass.

Claim Rejections - 35 USC § 103

9. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 1, 3-12, 14, 15, 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor (US Patent 5,134,882 hereinafter referred to as "Taylor") in view of Thomas.

(a) As to claim 1, Taylor discloses a fibre optic accelerometer comprising a seismic mass (1) coaxially constrained on a cylinder (3) of compliant material, (figures 1, 2; column 2, lines 4-25), the cylinder (3) being circumferentially wound with optical fibre (41) (figures 1, 2; column 2, lines 4-25), such that axial compression of the cylinder (3) by the seismic mass (2) increases stress in the optical fibre (41) (figures 1, 2; column 2, lines 4-67).

Taylor, however, does not expressly disclose the seismic mass being constrained within the cylinder, arranged to prevent the cylinder deforming inwardly under axial compression.

Thomas discloses a fibre optic accelerometer (10) comprising a seismic mass (23) coaxially constrained within a cylinder (12) of compliant material, arranged to prevent the cylinder (12) deforming inwardly under axial compression (figures 1-7; page 6, line 22 - page 7, line 28), the cylinder (12) being circumferentially wound with optical fibre (11) (figures 1-7; page 2, line 18 - page 3, line 3; page 6, line 6 - page 8, line 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Taylor's accelerometer so as to include the seismic mass being constrained within the cylinder, arranged to prevent the cylinder deforming inwardly under axial compression, as taught by Thomas, because "[w]ith the mass completely enclosed in the flexible shell the overall size of the device can be reduced", as suggested by Thomas (page 7, lines 22-25).

(b) As to claim 3, Taylor discloses that the seismic mass (1) includes a disc shaped portion (figures 1, 2; column 2, lines 6-20).

(c) As to claim 4, Taylor, as modified by Thomas, discloses the claimed invention except for the mass being secured by a tension member to a base plate.

Thomas discloses that the seismic mass (23) is secured by a tension member (21) to a base plate (25) (figures 1-7; page 6, lines 6-20).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a seismic mass constrained within a cylinder, as taught by Thomas, as set forth above in the rejection of claim 1, and to further have that mass

secured by a tension member to a base plate, as also taught by Thomas, because it helps prevent sideways motion of the mass, which would undesirably lead to calculation errors, as suggested by Thomas (page 5, line 21 - page 6, line 11).

(d) As to claims 5 and 6, Taylor, as modified by Thomas, discloses the claimed invention except a spacer, integral with a base plate, being provided between the cylinder and the base plate.

Thomas discloses that a spacer (22), being integral with the base plate (25), is provided between the cylinder (12) and the base plate (25) (figures 1-7; page 6, lines 6-31).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Taylor's apparatus so as include a spacer, integral with a base plate, between the cylinder and the base plate, as taught by Thomas, because this would help holding the base plate in contact with the tension member, as suggested by Thomas (page 5, lines 21-35).

(e) As to claim 7, Taylor discloses the optical fibre (41) being wound in a single layer (figures 1, 2; column 2, lines 4-67).

(f) As to claim 8, Taylor, as modified by Thomas, discloses the claimed invention except for a base plate being integral with a platform or structure.

Thomas discloses a base plate (25) being integral with a platform or structure (figure 2; page 6, lines 6-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a seismic mass constrained within a cylinder, as taught by Thomas, as set forth above in the rejection of claims 1-4, and to further include a base plate integral with a platform/structure, as taught by Thomas, because this would add stability to the structure, as suggested by Thomas (page 6, lines 6-34).

(g) As to claim 9, Taylor discloses, "it is not essential to use a single compliant cylinder 3 but that the two portions 31 and 32 could be separate compliant members with parallel axes and preferably arranged axially of each other" (column 3, lines 14-17). Taylor, as modified by Thomas, does not expressly disclose the seismic mass (1) being constrained within first and second cylinders.

Thomas discloses seismic mass (23) being coaxially constrained within first and second cylinders (13) of compliant material, each cylinder (13) being circumferentially wound with optical fibre (11) (figures 5, 6; page 6, line 22 - page 7, line 28).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Taylor's accelerometer, as taught by Taylor, as set forth above in the rejection of claim 1, and to further have the seismic mass constrained within first and second cylinders, as taught by Thomas, because Taylor discloses an embodiment with first and second cylinders, and this would "increase the responsivity" of the accelerometer, as suggested by Thomas (page 6, lines 20-25).

(h) As to claim 10, Taylor, as modified by Thomas, discloses the claimed invention except the seismic mass (23) comprising a first circumferentially located bearer member arranged to bear on an end of at least one of two compliant cylinders.

Thomas discloses the seismic mass (23) comprising a first circumferentially located bearer member (14) arranged to bear on an end of at least one of the compliant cylinders (13) (figures 1-7; page 6, line 22 - page 7, line 28).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Taylor's accelerometer, as taught by Taylor, as set forth above in the rejection of claims 1 and 9, and to further include a first circumferentially located bearer member arranged to bear on an end of at least one of two compliant cylinders, as taught by Thomas, because this would add stability to the structure, as suggested by Thomas (page 6, lines 6-34)

(i) As to claim 11, Taylor, as modified by Thomas, discloses the claimed invention except a first circumferentially located bearer member being arranged to bear on respective ends two compliant cylinders.

Thomas discloses the first circumferentially located bearer member (14) being arranged to bear on respective ends of both of the compliant cylinders (13) (figures 1-7; page 6, line 22 - page 7, line 28).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Taylor's accelerometer, as taught by Taylor, as set forth

above in the rejection of claims 1 and 9, and to further include a first circumferentially located bearer member arranged to bear on respective ends of two compliant cylinders, as taught by Thomas, because this would add stability to the structure, as suggested by Thomas (page 6, lines 6-34).

(j) As to claim 12, Taylor, as modified by Thomas, discloses the claimed invention except for a second circumferentially located bearer member being arranged to bear on an end of a second of two compliant cylinders.

Thomas discloses a second circumferentially located bearer member (14) arranged to bear on an end of a second of the compliant cylinders (13) (figures 1-7; page 6, line 22 - page 7, line 28).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Taylor's accelerometer, as taught by Taylor, as set forth above in the rejection of claims 1, 9 and 10, and to further include a second circumferentially located bearer member arranged to bear on an end of the second of two compliant cylinders, as taught by Thomas, because this would add stability to the structure, as suggested by Thomas (page 6, lines 6-34).

(k) As to claim 14, Taylor, as modified by Thomas, discloses the claimed invention except for an optical interferometer comprising an accelerometer.

Thomas discloses an optical interferometer comprising an accelerometer (page 2, lines 15-21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Taylor's accelerometer in an optical interferometer, as taught by Thomas, because fibre optic interferometer accelerometers "can exhibit fairly high responsivities and sensitivity", as suggest by Thomas (page 2, lines 15-21).

(l) As to claims 15 and 17, Taylor discloses a method of measuring acceleration comprising providing a seismic mass (1) coaxially constrained on a cylinder (3) of compliant material (figures 1, 2; column 2, lines 4-25), the cylinder (3) being circumferentially wound with optical fibre (41) (figures 1, 2; column 2, lines 4-25), axially displacing the seismic mass (1) so as to compress the cylinder (3) thereby increasing the stress induced in the optical fibre (41) and determining a stress value in the optical fibre (41) (figures 1, 2; column 2, line 4 - column 3, line 17).

Taylor, however, does not expressly disclose the seismic mass being constrained within the cylinder.

Thomas discloses a method of measuring acceleration using a fibre optic accelerometer (10) comprising a seismic mass (23) coaxially constrained within a cylinder (12) of compliant material (figures 1-7; page 6, line 22 - page 7, line 28), the cylinder (12) being circumferentially wound with optical fibre (11) (figures 1-7; page 2, line 18 - page 3, line 3; page 6, line 6 - page 8, line 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Taylor's method of measuring acceleration so as to

include the seismic mass being constrained within the cylinder, as taught by Thomas, because “[w]ith the mass completely enclosed in the flexible shell the overall size of the device can be reduced", as suggested by Thomas (page 7, lines 22-25).

(m) As to claim 20, Taylor discloses the compliant material being rubber like/ “elastomeric rubber” (column 2, lines 4-13).

Conclusion

11. The prior art made of record and not relied upon, cited in the attached 892 form, is considered pertinent to applicant's disclosure.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAMIR M. SHAH whose telephone number is (571)272-2671. The examiner can normally be reached on Monday-Friday 9:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hezron Williams/
Supervisory Patent Examiner, Art Unit 2856

/S.M.S./
Samir M. Shah
Art Unit 2856
10/29/2010